DEVICE AND METHOD FOR COUPLING A CONDUIT

FIELD OF THE INVENTION

This invention relates to a device and method for coupling conduits. More particularly, the invention relates to a coupling device and method for using same to couple together two or more conduits, such as used in risers and plenums.

BACKGROUND OF THE INVENTION

With the evolution of today's integrated network environments in both homes and businesses, the design of a building's cabling infrastructure has become more demanding than ever before. Not only has system performance become critical, but consumers now demand mobility and flexibility, while maintaining low installation and maintenance costs.

As technology continues to evolve and traditional optical fibre and communications cabling methods become obsolete, designing or retrofitting buildings with optical fibre and communication cable raceways has become more common. This combines compliance with fire, building and electrical code requirements with the demands of users to be both flexible and up-to-date with technology.

Over the past few years, there has been a dramatic evolution of voice and data communications systems and an increase in the routing of voice/data cable in air handling plenums. At the same time, air handling plenums have become more common with the advent of integrated heating, ventilation and air conditioning (HVAC). In general, plenums are commonly referred to as the space above the ceiling used for air management and may be considered as compartments or chambers to which one or more ducts are connected and that may form part of the air distribution system. The plenum space may also be used typically to house communication and fibre optic cables for holding wires, cables or busbars. From a fire safety perspective, air handling plenums present unique challenges to the prevention and migration of fire and smoke because they usually involve large open spaces that interconnect different parts of a building. If not constructed of the right type of materials, fire and smoke can move easily to portions of the building that are remote from the area in which a fire may have started.

In most buildings, the electrical, plumbing and HVAC services start on either the main floor or the lowest floor and are distributed throughout the building in vertical and horizontal shafts. Within a single storey, these services are typically run through the horizontal space above ceiling tiles or drywall, or beneath the finish flooring, which are generally referred to as plenums as discussed above. Similarly, building codes typically identify vertical shafts that house all of the building services and interconnect the stories of a building as a riser. As an example, telecommunication cabling typically enters the building at a common point or source such as the telephone room or equipment room, and from there, cabling is distributed throughout the building. In multi-storey buildings, risers are needed. In general, risers may be understood as a pathway to run cables, and other building services to pass from one floor to another, and, may comprise one or more conduits. In general, risers may be understood as a pathway to run cables, and other building services to pass from one floor to another. Risers may also be constructed so that they can prevent fire and smoke from moving from the storey that the fire originates on to other storeys within the building.

Furthermore, there has been a need for general use optical fibre cable and communication raceways which excludes risers, plenums and other spaces used for environmental air when they contain specific types of optical fibre cables. This type of raceway is resistant to the spread of fire when tested in accordance with various flame test requirements as set out by Underwriters Laboratories (UL) and Canadian Standards Association (CSA) as well as other standard testing organizations.

In the event of a fire, cables abandoned and left in the plenums can become a safety hazard to the occupants of a building by unnecessarily adding to the fuel load in the plenum. With the growth in the use of communication cable in recent years, the authoritative body of the codes and standards have recognized that some remedial action is necessary to prevent an accumulation of combustible materials in plenum spaces. Architects, designers, engineers and contractors installing cables in plenums now need to take code requirements regarding abandoned cable into account when designing new buildings and retrofitting older ones. The most convenient way to remove and replace a cable is to have it installed in a raceway. As technology continues to evolve and traditional optical fibre and communications cabling methods become obsolete, buildings designed or retrofitted with raceways will easily allow compliance with fire, building and electrical code requirements while, at the same time, being up-to-date with technology. In general, raceways may be considered channels for loosely holding cables and wires, both electrical, fibre optic, etc. in buildings. Raceways may be formed of one or more conduits that may be metallic or non-metallic through which cables may be pulled. Conduits may be circular, substantially circular or have other cross-sections. Conduits may also be corrugated. Conduits should not be filled beyond the limitations set out in fire, building and/or electrical codes.

However, simply inserting raceways into buildings does not provide the flexibility in which to accommodate the growing demands of technologies as well as changes in the fire, building and electrical code requirements. Furthermore, several existing buildings having raceways designated specifically for holding wires, cables or busbars, must be modified as time goes on and user needs change. While the prior art has permitted the development of new conduits to accommodate different design changes or modifications in building designs, this increases the cost of installation, as well as material costs greatly. For instance, in some prior art designs, multiple raceways may be needed to accommodate different cables. In this case, several individual raceways may emanate from a single pullbox thereby increasing the cost for installation as well as the material costs. Furthermore, this increases the complexity of the building's cabling infrastructure which makes later modifications more complex and costly. Alternate prior art designs have involved multiple pullboxes emanating from a single equipment room. In this case, multiple pullboxes would increase the cost of the installation because of the increased material costs and installation costs for each of the pullboxes.

Accordingly, there is a need in the art for a simple and robust method and device which can facilitate changes in the design of a building's cabling infrastructure while providing the mobility and flexibility consumers demand. Furthermore, there is a need in the art for a method and device which can facilitate such changes while maintaining low installation and maintenance costs.

SUMMARY OF THE INVENTION

Accordingly, it is an object of this invention to at least partially overcome some of the disadvantages of the prior art.